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"To the solid ground
Of Nature trusts the mind which builds for aye."—WORDSWORTH.

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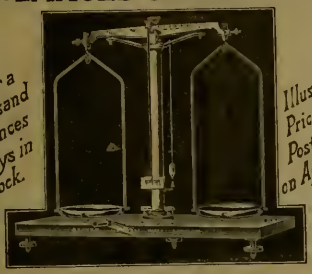

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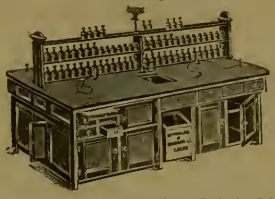

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Spanish cedar (*Cedrela odorata*) and the *quebracho* are the most important. These are more than sufficient to meet the home demand, and are largely exported, but at the same time short-sighted exploitation bids fair to impair seriously this industry. On the other hand, it is, of course, quite possible that further study of the timber resources will result in the discovery of other hardwoods of commercial value. Of more economic importance is the supply of softwoods. The Parana pine (*Araucaria brasiliensis*) of southern Brazil and the Chilean pine (*A. imbricata*) seem to be the only two species of importance, and are being increasingly used in place of imported coniferous wood from the northern hemisphere. But the limited area of these softwoods and the growing demand for cheap timber make it improbable that South America can ever dispense with her timber imports, and certainly there is no hope of her being able to export softwoods. In view of this paucity of timber there is urgent need of the South American States instituting scientific management of their forests and the prevention of undue exploitation. South America is far less rich in commercial timber than might be supposed, and her resources are not inexhaustible.

THE retreat of the Barry glacier in Prince William Sound, Alaska, has been studied for many years. In 1910 the National Geographic Society's expedition showed that the face had withdrawn three miles since 1899. This expedition gave an exhaustive account of all observations previous to 1910. Later observations are contained in a brief paper by Mr. B. L. Johnson, published as Professional Paper 98 C of the United States Geological Survey. Mr. Johnson visited the glacier in 1913 and 1914, and found in both years that the rate of retreat had been maintained. Between 1910 and 1914 the rate of retreat was 8200 ft. on the eastern side, and about 2500 ft. on the western side. The rate on the western side seems to have decreased after the uncovering of bedrock on that side. The paper is illustrated with several photographs of the glacier in various stages of its retreat.

SOME details of the Indo-Russian triangulation connection are given in the *Geographical Journal* for November (vol. xlviii., No. 5). By 1911 Gilgit had been connected with the Indian system, and the Russians on their side had reached Pamirski port in about lat. 38° 13′ N., long. 75° E. But the connection of Gilgit with the Russian survey across a strip of Afghan territory presented difficulties of a formidable nature, as it involved the crossing of the Karakorams. The only feasible route was from Gilgit up the Hunza valley to the Kilik Pass, involving the survey of about one hundred miles up a narrow, precipitous-sided gorge, flanked by mountains rising 6000–7000 ft. above the valley floor. The number of stations in this survey was thirty-three, and their average height is 16,222 ft. The work was carried out in the face of great difficulties and hardships by the late Lieut. H. Bell, R.E., in 1911 and 1912, and completed by Lieut. Mason in 1913. A report of the work is contained in the Records of the Survey of India, vol. vi. Capt. R. W. Hingston, I.M.S., has some notes of the geology and climate, as well as a valuable paper on his observations of blood at high altitudes.

SOME observations on the *bai*, or so-called "sand-mist," a phenomenon of frequent occurrence in the Far East, are contributed by Prof. Yuji Wada to *Temmon Geppo*, the organ of the Astronomical Society of Japan (vol. ix., No. 6, August, 1916). The mist, which is ascribed to an atmospheric depression over the sandy Tsai-pih district of Central China, is prevalent in spring. In winter the ground is frozen, and in summer it is knit together by grass, but between these seasons the loose surface is churned up by the wind, and clouds of sand rise to a great height and are carried eastward, afterwards collecting moisture and falling as a coloured mist. During the fall the sun is obscured and objects assume a yellow or ashy hue, the conditions closely resembling those attending a solar eclipse, for which the phenomenon was often mistaken by ancient chroniclers. Characteristic of the *bai* is the thick coating of very fine yellow dust which settles everywhere. During a sand-mist at Chemulpo on March 4, 1915, the author measured a fall of sand on a sheet of glass in an underground chamber protected from the wind. A twenty-four hours' deposit on 118·6 sq. cm. weighed one centigram. On the same day a fall of ¼ in. was recorded in Etchu province, Japan. Sometimes the sand descends in a rainstorm. An instance is cited of a violent storm of orange-coloured rain in 1306, which caused the deaths of many persons and cattle. The author concludes that the *bai* is akin to the "blood rain" and "red snow" familiar to European meteorologists.

THE July issue of the *Agricultural Journal of India* (vol. xi., part 3) contains an article on "Photographic Illustration," by Mr. C. M. Hutchinson, which will be very helpful to the many scientific workers whose imperfect acquaintance with the limitations of the half-tone process of reproduction of photographic illustrations has so often led to unexpected disappointment. The questions of lighting, exposure, development, class of plate, and use of light filters are discussed and well illustrated by an excellent series of reproductions.

THE last two parts of the Edinburgh Mathematical Society's Proceedings (May and September, 1916) contain the usual amount of interesting matter. Perhaps the most important paper is that of Dr. J. Dougall on the solution of Mathieu's differential equation; this equation is important for physical applications, and Dr. Dougall has found solutions adapted for computation. Possibly they are not the proper analytical forms; these may be quotients of integral functions, as in the case of the proper representation of the elliptic functions; but the paper certainly shows an advance on the practical side. Other papers deserving attention are Mr. Brown's on Fourier's integral, Mr. Milne's on differential equations, Mr. D. G. Taylor's on linear substitutions, and Mr. Tinto's on space transformations. We have also received Nos. 19 and 20 of the same society's *Mathematical Notes*; they show that the study of mathematics at Edinburgh is in a very healthy condition, and contain a number of elegant demonstrations.

THE researches of Prof. Kamerlingh Onnes have shown that at temperatures below 4° or 5° on the absolute scale mercury, tin, and lead have extremely small electrical resistances. If the temperature of a wire of either of these materials in this super-conducting state is gradually increased, at a certain temperature known as "the critical temperature" the resistance rapidly increases. If the wire is subjected to a magnetic field this critical temperature is lower than it is in the absence of a field. If the current used in testing the resistance is increased, the critical temperature is also lowered. In the Journal of the Washington Academy of Sciences for October 19 Mr. F. B. Silsbee, of the Bureau of Standards, makes use of the experimental data available to show that the effect of the increase of the testing current on the critical temperature is due entirely to the magnetic field that current produces. This accounts for the differences observed in the effect of the current according to whether the wire used in the tests is straight or coiled. If further work supports Mr. Silsbee's theory, it should afford a clue to a more satisfactory explanation of the super-conducting state.

We have received a little book by Mr. J. W. Giltay dealing with bow instruments from a physical point of view ("De Strijkinstrumenten uit een natuurkundig oogpunt beschouwd"; Leyden, 1916, pp. xi+103, illustrated). It is a simple description of the action of the various parts of the violin, with a reference here and there to other bowed instruments. An elementary knowledge of acoustics is assumed. The book should appeal in the first place to musicians taking a scientific interest in their instruments, and in the second place to physicists. For the most part the author describes and discusses the results of earlier workers, especially those of Savart, Helmholtz, and Sir William Huggins, but he has also included a number of his own experiments, particularly on the effect of the air volume enclosed in the sounding-box. He is not convinced that a violin improves by being played upon.

The "Catalogue (No. 369) of Miscellaneous Literature" just issued by Mr. F. Edwards, of High Street, Marylebone, though mainly consisting of books of general interest, contains particulars of several works appealing to readers of NATURE—on botany, travel, and, notably, natural history. The catalogue directs attention to many publications of the Zoological Society of London, offered, for the most part, at greatly reduced prices.

OUR ASTRONOMICAL COLUMN.

EPHEMERIS OF COMET 1916*b* (WOLF).—After having passed conjunction, this comet will again be in a favourable position for observation as a morning star during the winter and spring. The following ephemeris for Greenwich midnight is given by Mr. R. T. Crawford in Lick Observatory Bulletin No. 286:—

	R.A.	Decl.		R.A.	Decl.
	h. m. s.	° ′		h. m. s.	° ′
Dec. 1	15 10 4	−5 13	Jan. 29	16 59 56	−5 15
10	25 10	5 37	Feb. 8	17 21 2	4 28
20	42 39	5 56	18	42 49	3 24
30	16 0 53	6 5	28	18 5 13	2 1
Jan. 9	19 50	6 2	Mar. 5	16 38	1 12
19	39 32	5 46			

The values of log Δ on December 1, December 31, February 1, March 1, are 0·5820, 0·5237, 0·4434, 0·3023 respectively. Taking the brightness at discovery on May 10 as unity, the theoretical brightness on these dates is 3·0, 4·0, 8·8, and 15·6. The path of the comet during the above period is mainly through Ophiuchus.

THE GREAT RED SPOT ON JUPITER.—This planet being now favourably visible in the evening sky, observations can be conveniently made of the surface markings, which are very abundant and diversified at the present time. The red spot is smaller than formerly, and the hollow in the great S. equatorial belt less prominent. The first-named object will be central at about the following times:

	h. m		h. m.
Dec. 3 ...	9 35	Dec. 13 ...	7 50
4 ...	5 20	15 ...	9 28
6 ...	7 4	18 ...	6 59
8 ...	8 43	20 ...	8 37
10 ...	10 21	27 ...	9 23
11 ...	6 12	30 ...	6 52

Mr. F. Sargent, of Bristol, who has been observing this planet with considerable success in recent years, informs Mr. Denning that the large dark spot in the S. tropical zone, known as the "south tropical disturbance," is now about 120° long, so that it extends over one-third of the circumference of Jupiter. The middle of this "disturbance" follows the middle of the red spot about two and a half hours, and the preceding end of the former may be expected to overtake the following end of the latter at the end of January. Since June, 1914, the rate of rotation of the red spot has been about 9h. 55m. 37s., and this rate may be expected to exhibit an acceleration next year when involved with the S. tropical disturbance.

THE METEORIC SHOWER FROM BIELA'S COMET.—Though no rich display occurred this year, it is interesting to note that this shower visibly returned. Between November 20 and 24 ten slow meteors were recorded giving a fairly well-defined radiant at 27°+42° near γ Andromedæ. These meteors were seen by various observers, including Mr. Denning at Bristol, Mrs. Wilson at Totteridge, Miss Cook at Stowmarket, and Miss Strover at Bexley Heath. It seems probable that a few of these Andromedids are visible every year, and that meteors are distributed completely around the cometary orbit, though sparingly in sections of it.

THE COLOURS OF STARS IN GLOBULAR CLUSTERS.—Dr. Shapley has recently obtained further important data relating to the colour-indices of stars included in globular clusters (Proc. Nat. Acad. Sciences, vol. ii., p. 525). The stars in a cluster of this type may be supposed to be at sensibly the same distance from the earth, and apparent magnitudes may accordingly be assumed to be directly proportional to the total light emitted. In four clusters which have now been fully investigated, it has been found that the average colour-index is distinctly greater for the brighter stars than for the fainter ones, or that relatively high luminosity is accompanied by greater redness. The total light emission of the bluer stars, for which the surface temperature is presumably in excess of 10,000° C., thus appears to be less than that of many of the redder stars, which have surface temperatures only half as great. Since the emission per unit area is much less for the red than for the bluer stars, it follows that in the clusters investigated the volumes of the bright redder stars are very great in comparison with those of the stars which are fainter and relatively blue. The ancestral relationships of the two classes must be accounted for in any satisfactory hypothesis of the evolutionary sequence of spectral types.

FOSSIL VERTEBRATE ANIMALS.

THE American Museum of Natural History, New York, has lately issued a fifth volume of papers on fossil vertebrata, reprinted from the Bulletin of the museum for the years 1913–14. It has long taken a leading place in researches of the kind here detailed, and the new contributions to our knowledge of many groups of extinct vertebrate animals are of the usual interest and importance. Besides the members of the staff, the authors include other well-known American palæontologists, while Dr. Robert Broom and Baron F. von Huene make specially interesting contributions, having studied the American fossils after their long experience of corresponding specimens from South Africa and Europe. Dr. Broom has, indeed, furnished the American Museum with a large collection of South Africa Permo-Triassic reptiles for comparison with the contemporaneous American groups, and he describes many of his specimens in the volume before us.

Several studies of the early reptiles and labyrinthodonts are appropriately followed by Dr. Broom's discussion of the structure and affinities of the Mesozoic multituberculate mammals and their rare Eocene successors. His description of a new skull of Polymastodon is especially interesting, and he agrees with the usual opinion that some of the herbivorous multituberculates were the ancestors of the existing monotremes. The latest forms of extinct land-reptiles from